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10/520,923	01/12/2005	Kazuya Kamitake	50395-305	4825
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WILLIAMS, ALEXANDER O				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,923

Applicant(s)

KAMITAKE ET AL.

Examiner

Alexander O. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-17 and 21-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-17 and 21-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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Serial Number: 10/520923 Attorney's Docket #: 50395-305

Filing Date: 1/12/2005; claimed foreign priority to 7/17/2002 & 4/2/2003

Applicant: Kamitake et al.

Examiner: Alexander Williams

This application is a 371 of PCT/JP03/08624 filed 7/7/2003.

Applicant's Request for reconsideration filed 3/28/2008 has been acknowledged.

Claims 1-11 and 18-20 have been cancelled.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12, 27 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Acocella et al. (U.S Patent # 5,031,029).

12. Acocella et al. (figures 1 and 2) specifically figure 1 show a member for a semiconductor device comprising a base member **8** made of an alloy or composite mainly composed of Cu and W and/or Mo, wherein a coating layer **5** made of a hard carbon film is provided on at least a surface of the base member on which another member for the semiconductor device is bonded with a resin (**inherent**), the coating layer has a thickness of 0.1 to 10 .mu.m. Note that the specification contains no

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disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

27. The member for a semiconductor device according to claim 12, Acocella et al. show wherein a plating layer 7 of Ni is provided between the coating layer and the surface of the base member on which the coating layer is formed.

30. Acocella et al. show a semiconductor device employing the member for a semiconductor device according to claim 12.

(6) It is critical pursuant to the present invention that the thickness of this rigidizing layer be about 2 to about 10 microns, preferably about 2 to about 6 microns and most preferably about 5 microns.

(7) Suitable layers that will both reinforce the structure and serve to promote good bonding between the copper and hard carbon include tungsten, tungsten carbide, titanium nitride, aluminum nitride and preferably silicon. The most preferred rigidizing layer is amorphous silicon.

(12) According to another aspect of the present invention, the non-graphitic hard carbon layer is employed as an anti-abrasive layer on copper devices such as inserts or pistons in contact with a semiconductor chip. Due to the thermal coefficient of expansion mismatch between cooling hardware and the chip substrate such as silicon, scratching can occur when the chip is powered on. The non-graphitic hard carbon layer prevents the copper from scratching and keeps the thermal resistance of the metal-chip interface from increasing. The devices, according to this aspect of the present invention, do not require the rigidizing layer (6), although if desired it can be included, but do require the layer (7) being of nickel, chrome, cobalt and/or titanium and preferably nickel in order to insure a

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tenacious bond of the carbon layer and copper. The layer (7) is typically about 50 to about 2000 angstroms thick and preferably about 500 to about 1500 angstroms thick.

(13) The following non-limiting example is presented to further illustrate the present invention.

(14) EXAMPLE

(15) Onto the top surface (9) of a copper heat sink of the type illustrated in FIG. 2 is deposited a nickel layer about 1000 angstroms thick. The nickel layer is deposited by sputtering from a nickel target. Next an amorphous silicon layer about 4 microns thick is deposited on the nickel layer by plasma enhanced chemical vapor deposition from a mixture of 25% silane in argon. A non-graphitic hard carbon layer about 5000 angstroms thick is deposited on the silicon layer by plasma enhanced chemical vapor deposition from acetylene.

Claims 14 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakamoto et al. (U.S Patent # 4,725,345).

14. Sakamoto et al. (figures 1 to 11) specifically figure show a member for a semiconductor device comprising a base member **95** made of an alloy or composite mainly composed of Al--SiC, wherein a coating layer **92** made of a hard carbon film is provided on at least a surface of the base member on which another member for the semiconductor device is bonded with a resin (**inherent**), the coating layer has a thickness of 0.1 to 10 .mu.m. Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

31. Yamazaki et al. show a semiconductor device employing the member for a semiconductor device according to claim 14.

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(14) As shown in FIG. 3, hard carbon layers 32 each having the thickness of 0.3 .mu.m are formed onto both surfaces of an acoustic diaphragm base material 31 made of titanium of the thickness of 20 .mu.m which is constituted by integrally forming a voice coil bobbin portion and a dome portion. A voice coil is wound around the voice coil bobbin portion of the integrated type diaphragm. The characteristics of the tweeter unit having a free edge were measured. Thus, it has been found that the high frequency characteristic was improved, namely, the reproducible limit frequency in the high frequency range was extended. The reproduced sound with less distortion until a super high frequency could be obtained.

(32) Application 7

(33) A hard carbon layer is formed onto an FRM (fiber reinforced metal) diaphragm base material due to a hot press process using aluminium or aluminium alloy as the matrix and SiC as the heat-resisting reinforced fiber. The propagation velocity of this FRM diaphragm base material itself was within a range of 6,000 to 6,500 m/sec.

(34) As shown in FIG. 8, a hard carbon layer 82 is formed onto the surface of such an FRM diaphragm base material 83 in a manner similar to the application 6. In this case, the propagation velocity of the whole diaphragm was within a range of 8,000 to 9,000 m/sec and the propagation velocity was remarkably improved.

(35) Application 8

(36) As shown in FIG. 9, an FRM multi-layer diaphragm base material using a metal aluminium or aluminium alloy honeycomb 94 as a core material and having Al/SiC layers 95 on both front and back surfaces is obtained. A hard carbon layer 92 is formed on the surface of this base material in a manner similar to the application 6. In this case as well, the Young's modulus and sonic velocity of the whole diaphragm were also remarkably improved.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Initially, it is noted that the 35 U.S.C. § 103 rejection based on a carbon film and a resin deals with an issue (i.e., the integration of multiple pieces into one piece or conversely, using multiple pieces in replacing a single piece) that has been previously decided by the courts.

In Howard v. Detroit Stove Works 150 U.S. 164 (1893), the Court held, "it involves no invention to cast in one piece an article which has formerly been cast in two pieces and put together...."

In In re Larson 144 USPQ 347 (CCPA 1965), the term "integral" did not define over a multi-piece structure secured as a single unit. More importantly, the court went further and stated, "we are inclined to agree with the solicitor that the use of a one-piece construction instead of the [multi-piece] structure disclosed in Tuttle et al. would be merely a matter of obvious engineering choice" (bracketed material added). The court cited In re Fridolph for support.

In re Fridolph 135 USPQ 319 (CCPA 1962) deals with submitted affidavits relating to this issue. The underlying issue in In re Fridolph was related to the end result of making a multi-piece structure into a one-piece structure. Generally, favorable patentable weight was accorded if the one-piece structure yielded results not expected from the modification of the two-piece structure into a single piece structure.

Claims 14, 16, 31 and 32 are under 35 U.S.C. 103(a) as being unpatentable over Matsuki et al. (U.S Patent Application Publication # 2006/0084280 A1).

14. Matsuki et al. (figures 1 to 4e) specifically figure 4(a) show a member for a semiconductor device comprising a base member **32** made of an alloy or composite mainly composed of Al-SiC, wherein a coating layer (**lower portion of 31**) made of a hard carbon film is provided on at least a surface of the base member on which another member for the semiconductor device is bonded with a resin (**upper portion of 31**), the coating layer has a thickness of 0.1 to 10 .mu.m. (**see paragraphs 00634-0066**). Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

16. Matsuki et al. (figures 1 to 4e) specifically figure 4(a) show a member for a semiconductor device comprising a base member **32** made of an alloy or composite mainly composed of Si-SiC, wherein a coating layer (**lower portion of 31**) made of a hard carbon film is provided on at least a surface of the base member on which another member for the semiconductor device is

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bonded with a resin (**upper portion of 31**), the coating layer has a thickness of 0.1 to 10 μm . (**see paragraphs 00634-0066**). Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

31. Matsuki et al. show a semiconductor device employing the member for a semiconductor device according to claim 14.

32. Matsuki et al. show a semiconductor device employing the member for a semiconductor device according to claim 16.

Therefore, it would have been obvious to one of ordinary skill in the art to use the hard carbon film and the resin as "merely a matter of obvious engineering choice" as set forth in the above case law.

[0063] A thickness of an organic polymer can be appropriately selected according to intended uses. In an embodiment, it is 50 nm-1000 nm or 100 nm-500 nm. A deposition rate differs depending on a liquid monomer used; in an embodiment, it is approximately 0.1-20 nm/sec.

[0064] A carbon polymer film obtained differs depending on a liquid monomer used; in an embodiment, a modulus is in the range of approximately 4-10 GPa or approximately 5-8 GPa. Additionally, hardness is in the range of approximately 0.1-2 GPa or approximately 0.3-1 GPa.

[0065] Hard Mask Formation

[0066] An example of hard mask formation and use is shown in FIG. 4. FIG. 4 (a) is a schematic view of a structure of a semiconductor device substrate which an organic carbon polymer

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film according to the present invention is formed as a hard mask. On an under structure 33 in which an electric circuit is formed, a substrate film 32 which is a dielectric film (Silicon oxide, SiOF, SiC, other low-dielectric-constant films, etc.), a capacitor material (SiN, Al₂O₃, HfO₂, Ta₂O₃, etc.), an electrode material, metal (Poly Si, TiN, TaN, Ru, Al, etc.), etc. is formed; on top of that, an organic carbon polymer film is formed as a hard mask 31. On top of that, a photo resist film 30 (photopolymer, etc.) is formed. Additionally, the present invention is not limited to this structure. Further, a structure may be a film-laminated structure; a dielectric film may be a low-k film formed by a spin-on process (rotary coating).

[0067] In FIG. 4(b), the photo resist film 30 is etched into a given pattern; in FIG. 4(c), the hard mask 31 is etched; after that, in FIG. 4(d), the dielectric film 32 is etched; in FIG. 4(e), the finally remaining hard mask 31 is removed by O₂ ashing, etc. By this, a dielectric film, etc. having a given pattern can be formed.

[0099] Additionally, FIG. 3 shows relation of film formation time and a thickness of a film formed obtained under the same conditions as the above. A film thickness is proportional to the film formation time; it was confirmed that thin films having a thickness from approximately 30 nm to approximately 400 nm were formed with satisfactory controllability. Additionally, RI, modulus, hardness of carbon polymer films obtained were all satisfactory and it is seen that the carbon polymer films obtained are suitable for a hard mask.

Claims 13, 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Accocella et al. (U.S Patent # 5,031,029) in view of Hirose et al. (Japan Patent Publication # 10-284643).

Accella et al. show the features of the claimed invention as detailed above, but fail to explicitly show wherein the alloy or composite mainly composed of Cu and W and/or Mo contains Cu of 5 to 40% by weight and wherein the surface of the base member on which the coating

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layer is formed has a surface roughness of 0.1 to 20 μm in R_{max} .

12. Acocella et al. (figures 1 and 2) specifically figure 1 show a member for a semiconductor device comprising a base member 8 made of an alloy or composite, wherein a coating layer 5 made of a hard carbon film is provided on at least a surface of the base member on which another member for the semiconductor device is bonded with a resin (**inherent**), the coating layer has a thickness of 0.1 to 10 μm .

Hirose et al. is cited for showing a substrate for a semiconductor device. Specifically, Hirose et al. (figures 1-8) discloses wherein the alloy or composite mainly composed of Cu and W and/or Mo contains Cu of 5 to 40% by weight and wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 μm in R_{max} for the purpose of providing a substrate for semiconductor device with which a sufficient resin bonding strength can be maintained.

13. The member for a semiconductor device according to claim 12, the combination with Hirose et al. show wherein the alloy or composite mainly composed of Cu and W and/or Mo contains Cu of 5 to 40% by weight (**see page 2, column 1, lines 8-10**).

21. The member for a semiconductor device according to claim 12, the combination with Hirose show wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 μm in R_{max} (**see page 2, column 1, lines 10-19**).

24. The member for a semiconductor device according to claim 12, the combination with Hirose show wherein pores in the surface of the base member on which the coating layer is formed

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have a depth of 100 .mu.m or less (see page 2, column 1, lines 20-22) .

Therefore, it would be obvious to one of ordinary skill in the art to use the thickness of Hirose et al.'s base member surface roughness, pores and composite characteristics are used to modify the same characteristics of Accella et al.'s base member for the purpose of providing a substrate for semiconductor device with which a sufficient resin bonding strength can be maintained.

Claims 15, 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (U.S Patent # 4,725,345) in view of Hirose et al. (Japan Patent Publication # 10-284643).

Sakamoto et al. show the features of the claimed invention as detailed above, but fail to explicitly show wherein the alloy or composite mainly composed of Cu and W and/or Mo contains Cu of 5 to 40% by weight and wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 .mu.m in Rmax.

Hirose et al. is cited for showing a substrate for a semiconductor device. Specifically, Hirose et al. (figures 1-8) discloses wherein the alloy or composite mainly composed by weight and wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 .mu.m in Rmax for the purpose of providing a substrate for semiconductor device with which a sufficient resin bonding strength can be maintained.

15. The member for a semiconductor device according to claim 14, the combination with Hirose et al. show wherein the alloy or

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composite mainly composed of Al--SiC contains SiC of 10 to 70% by weight (see page 11, column 19, lines 18-28).

22. The member for a semiconductor device according to claim 14, the combination with Hirose et al. show wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 μm in Rmax. (see page 2, column 1, lines 10-19).

25. The member for a semiconductor device according to claim 14, the combination with Hirose et al. show wherein pores in the surface of the base member on which the coating layer is formed have a depth of 100 μm or less (see page 2, column 1, lines 20-22).

Therefore, it would be obvious to one of ordinary skill in the art to use the thickness of Hirose et al.'s base member surface roughness, pores and composite characteristics are used to modify the same characteristics of Sakamoto et al.'s base member for the purpose of providing a substrate for semiconductor device with which a sufficient resin bonding strength can be maintained.

Claims 15, 17, 22, 23, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuki et al. (U.S Patent Application Publication # 2006/0084280 A1) in view of Hirose et al. (Japan Patent Publication # 10-284643).

Matsuki et al. show the features of the claimed invention as detailed above, but fail to explicitly show wherein the alloy or composite mainly composed of Cu and W and/or Mo contains Cu of 5 to 40% by weight and wherein the surface of the base member on which the coating

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layer is formed has a surface roughness of 0.1 to 20 μm in R_{max} .

Hirose et al. is cited for showing a substrate for a semiconductor device.

Specifically, Hirose et al. (figures 1-8) discloses wherein the alloy or composite mainly composed by weight and wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 μm in R_{max} for the purpose of providing a substrate for semiconductor device with which a sufficient resin bonding strength can be maintained.

15. The member for a semiconductor device according to claim 14, the combination with Hirose et al. show wherein the alloy or composite mainly composed of Al--SiC contains SiC of 10 to 70% by weight (see page 11, column 19, lines 18-28).

17. The member for a semiconductor device according to claim 16, Yamazaki et al. show wherein the alloy or composite mainly composed of Si--SiC contains Si of 10 to 35% by weight. (see page 11, column 19, lines 18-28).

22. The member for a semiconductor device according to claim 14, the combination with Hirose et al. show wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 μm in R_{max} . (see page 2, column 1, lines 10-19).

23. The member for a semiconductor device according to claim 16, Yamazaki et al. show wherein the surface of the base member on which the coating layer is formed has a surface roughness of 0.1 to 20 μm in R_{max} . (see page 2, column 1, lines 10-19).

25. The member for a semiconductor device according to claim 14, the combination with Hirose et al. show wherein pores in the

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surface of the base member on which the coating layer is formed have a depth of 100 .mu.m or less (see page 2, column 1, lines 20-22) .

26. The member for a semiconductor device according to claim 16, the combination with Hirose et al. show wherein pores in the surface of the base member on which the coating layer is formed have a depth of 100 .mu.m or less (see page 2, column 1, lines 20-22) .

Therefore, it would be obvious to one of ordinary skill in the art to use the thickness of Hirose et al.'s base member surface roughness, pores and composite characteristics are used to modify the same characteristics of Sakamoto et al.'s base member for the purpose of providing a substrate for semiconductor device with which a sufficient resin bonding strength can be maintained.

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuki et al. (U.S Patent Application Publication # 2006/0084280 A1) in view of Acocella et al. (U.S Patent # 5,031,029).

Matsuki et al. show the features of the claimed invention as detailed above, but fail to explicitly show a plating layer of Ni is provided between the coating layer and the surface of the base member on which the coating layer is formed.

Acocella et al. (figures 1 and 2) specifically figure 1 show a member for a semiconductor device comprising a base member 8 made of an alloy or composite, wherein a coating layer 5 made of a hard carbon film is provided on at least a surface of the base member on which another member for the semiconductor device is bonded with a resin (inherent), the coating layer has a thickness of 0.1 to 10 .mu.m., wherein a plating layer 7 of Ni is provided between the coating

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layer and the surface of the base member on which the coating layer is formed for the purpose of providing a sufficient resin bonding strength to be maintained.

28. The member for a semiconductor device according to claim 14, the combination with Acocella et al. show wherein a plating layer 7 of Ni is provided between the coating layer and the surface of the base member on which the coating layer is formed.

29. The member for a semiconductor device according to claim 16, Acocella et al. show wherein a plating layer 7 of Ni is provided between the coating layer and the surface of the base member on which the coating layer is formed.

Therefore, it would be obvious to one of ordinary skill in the art to use the thickness of Acocella et al.'s plating layer to modify the thickness of Matsuki et al.'s structure for the purpose of providing a sufficient resin bonding strength to be maintained.

Response

Applicant's arguments filed 10/29/07 have been fully considered, but are moot in view of the new grounds of rejections detailed above.

The insertion of Applicant's additional claimed language, for example, "in claims 12, 14 and 16, " cause for further search and consideration to make this action final in the Amendment filed 10/29/07.

Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE

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MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Field of Search	Date
U.S. Class and subclass: 257/704,707,710,778,734,737,738,641,e23,111,e23,181,e 23.191,e23.116,e23.056,e23.037 174/52.4,529	4/2/07 7/29/07 1/13/08 4/16/08
Other Documentation: foreign patents and literature in 257/704,707,710,778,734,737,738,641,e23,111,e23,181,e 23.191,e23.116,e23.056,e23.037 174/52.4,529	4/2/07 7/27/07 1/13/08 4/16/08
Electronic data base(s): U.S. Patents EAST	4/2/07 7/29/07 1/13/08 4/16/08

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O. Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30AM-7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272 1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alexander O Williams/
Primary Examiner, Art Unit 2826

/AOW/
4/21/2008